88-108

WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY GROUND-WATER STUDIES IN NEW YORK

GROUND-WATER ISSUES

More than 6 million of New York's 17.5 million residents rely on ground water for drinking supplies. Of those who depend on ground water, more than one-half live on Long Island where ground-water withdrawals total 486 million gallons per day (Mgal/d). A total of 487 Mgal/d is withdrawn in other parts of the State. Ground water in New York generally is suitable for most uses. Of the total ground water used, 51 percent is used for public supply, 22 percent for rural supply (domestic and livestock), 25 percent for industrial self-supplied, and 2 percent for irrigation. The major issues related to ground-water resource management in New York are:

- Ground-water quantity, including water-supply planning, saltwater intrusion, and artificial recharge, and
- Ground-water quality, including the effects of landfills, hazardous-waste sites, and land use.

U.S. GEOLOGICAL SURVEY PROGRAMS

The U.S. Geological Survey (USGS), established in 1879, is the principal source of scientific and technical expertise in the earth sciences within the Federal government. USGS activities include research and services in the fields of geology, hydrology, and cartography. The mission of the Water Resources Division of the USGS is to develop and disseminate scientific knowledge and understanding of the Nation's water resources. The activities of the Water Resources Division in New York are conducted by scientists, technicians, and support staff in Albany, Ithaca, Potsdam, and Syosset.

Hydrologic-data stations are maintained at selected locations throughout New York and provide a network for obtaining records on stream discharge and stage, reservoir and lake storage, ground-water levels, well and spring discharge, and the chemical quality of surface water and ground water. Current and historical water-resources data are stored in the USGS National Water Data Storage and Retrieval System data base. These data are used by water planners and others involved in making decisions that affect New York's water resources.

During 1987, 45 hydrologic investigations were conducted in cooperation with 43 Federal, State, and local agencies, 25 of which included studies of ground-water quantity and quality in cooperation with 16 Federal, State, and local agencies. These investigations provide information needed to answer questions specific to the State's principal ground-water issues as well as questions addressing statewide, multistate, and nationwide hydrologic problems. Five examples of ground-water studies conducted by the USGS and designed to address specific ground-water problems in New York are discussed below.

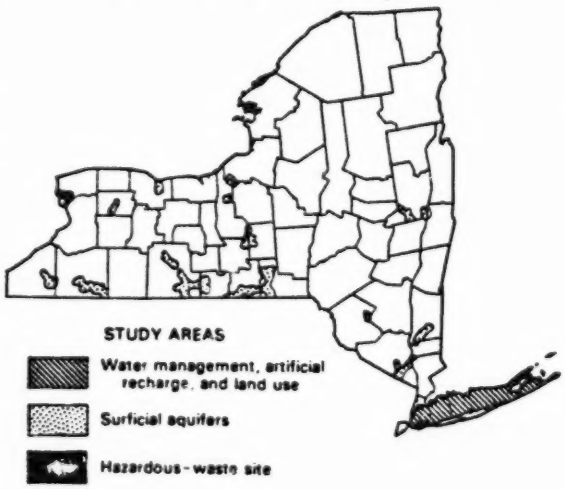
CASE STUDIES

Long Island Water-Resources Management

Information essential for ground-water quantity management on Long Island is being provided by a computer model of the Long Island ground-water system that was developed by the USGS. Ground-water pumpage projections to the year 2020 were provided by the Nassau County Department of Public Works, New York City Department of Environmental Protection, New York State Department of Environmental Conservation, Suffolk County Department of Health Services, and Suffolk County Water Authority. The USGS computer model was used to simulate projected pumpage and to compare the results of proposed county strategies for future ground-water development. The model also was used to evaluate the feasibility of using ground water to supplement New York City's surface-water supply during periods of drought.

Artificial Recharge in Nassau County

In cooperation with the Nassau County Department of Public Works, the USGS conducted a study to evaluate the effects of artificial recharge on ground-water levels and water chemistry. More than 800 million gallons of tertiary-treated sewage effluent were recharged to the upper glacial aquifer. Observations taken



during the study indicate that recharge basins provide a more effective means of moving large quantities of reclaimed water into the aquifer than do injection wells. The overall quality of water in the upper glacial aquifer has improved as a result of this artificial recharge project, and artificial recharge could play an important role in addressing the future water needs of Long Island.

Surficial Aquifers in Upstate New York

To provide information on ground-water quantity and quality in upstate New York, the USGS has delineated the boundaries and critical recharge areas of the 18 most heavily used aquifers. This investigation was made in cooperation with New York State Departments of Environmental Conservation and Health. Detailed hydrogeologic and land-use maps were prepared by the USGS. The maps are used by those State agencies in the regulation of waste disposal and other land uses.

Hazardous-Waste Sites Along the Niagara River

In 1979, the New York State Departments of Environmental Conservation and Health, and the U.S. Environmental Protection Agency (EPA) identified 215 hazardous waste-disposal sites in Erie and Niagara Counties. Concern that toxic substances from these sites could enter the ground-water system and possibly migrate toward the Niagara River led the EPA to ask the USGS to develop a computer model of ground-water flow in the area. The model will be used to determine ground-water flow patterns and rates which will give ground-water management agencies the information needed to assess the potential effects of hazardous waste-disposal sites on ground-water quality.

Effects of Land Use on Long Island

The USGS is studying nonpoint-source contamination in Nassau and Suffolk Counties. The purpose of the study is to relate land use to ground-water quality in the upper (water-table) aquifer. Statistical comparisons of water quality in areas classified according to 10 categories of land use indicate a correlation between land use and water quality in the underlying aquifer. Results show that contamination from human activities has affected ground-water quality. The results of this study will be used by water managers to develop strategies to protect Long Island's ground-water resource from contamination.

GROUND-WATER MANAGEMENT

The principal agencies responsible for ground-water management in New York State are the State Departments of Environmental Conservation and Health, regional planning agencies, and county and local governments. The Department of Environmental Conservation is responsible for the management of water resources and pollution control, and the Department of Health is responsible for the regulation and monitoring of public water supplies. Regional planning agencies are responsible for regional water-resource planning and technical assistance to county and local governments. The county and local governments are responsible for the planning and regulation of local land use and administration of local water-resource programs. All such agencies use ground-water data and the results of ground-water studies provided by the USGS. During 1987, the following Federal, State, and local agencies entered into interagency or cooperative cost-sharing agreements with the USGS to conduct ground-water investigations in New York:

Town of Brookhaven
Dutchess County
Nassau County Department of Health
Nassau County Department of Public Works
New York City Department of Environmental Protection
New York State Department of Environmental Conservation
Orange County
Saratoga County
Schuyler County
Suffolk County Department of Health Services
Suffolk County Water Authority
Tompkins County
U.S. Air Force
U.S. Environmental Protection Agency
Village of Kiryas Joel
Westchester County

SELECTED REFERENCES

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Eckhardt, D.A., Flipse, W.J. Jr., and Oaksford, E.T., 1987, Relation between land use and ground-water quality in the upper glacial aquifer in Nassau and Suffolk Counties, Long Island, New York: U.S. Geological Survey Water-Resources Investigations Report 86-4142, 35 p.

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Waller, R.M., and Finch, A.J., 1982, An atlas of 11 selected aquifers in New York: U.S. Geological Survey Open-File Report 82-553, 247 p.

Information on technical reports and data related to ground water in New York can be obtained from:

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